

What is claimed is:

1. A method of authenticating media, the media comprising a digital watermark including a first metric, said method comprising:  
decoding the first metric from the digital watermark;  
analyzing the digital watermark to determine a second metric; and  
comparing the first metric and the second metric to determine whether the media has been altered.
2. The method of claim 1 wherein an alteration comprises at least one of scanning, printing, editing, digital capture and photocopying the media.
3. The method of claim 2 wherein the alteration is determined if the first and second metrics do not relate.
4. The method of claim 1 wherein the first metric and the second metric each comprise a ratio between a selected coefficient and one or more neighboring coefficients.
5. The method of claim 1 wherein the first metric and the second metric each comprise a ratio between a magnitude of a selected coefficient and an average of neighboring coefficients.
6. The method of claim 1 wherein the digital watermark comprises a calibration signal, and wherein the first metric and the second metric are each determined from an analysis of the calibration signal.
7. The method according to claim 1 wherein the first metric and the second metric each comprise an evaluation of signal peaks at selected frequency coefficients of the media, where the media has been previously modified to include peaks at the selected frequencies.

8. The method of claim 1 wherein the media comprises at least one of a product tag, product label, identification card, identification document, image, photograph, picture, passport, license, stock certificate, bond certificate, deed, legal document, company logo, paper, product packaging, audio signal, video signal, sport card, trading card, digital signal, game card, advertisement, printed media, envelope, letterhead, stationary, book, sticker, business card, fabric and clothing.

9. The method according to claim 1 wherein said first metric comprises at least one of a power ratio, power signature of the digital watermark, energy level, threshold amount, color space information, spot color information, acceptable degradation level and printer type.

10. A digital watermark embedder comprising an embedding module to embed a benchmark in a media signal, the benchmark comprising a watermark signal characteristic, the benchmark to be included in the watermark signal embedded by said embedder.

11. A method of determining authenticity of media using a digital watermark embedded in the media, the digital watermark comprising a message, said method comprising:  
extracting the digital watermark from the media; and  
evaluating the extracted digital watermark in comparison to the message to measure degradation of the digital watermark based on differences between the extracted digital watermark and the message.

12. The method of claim 11, wherein the digital watermark message comprises a first metric and the evaluating step generates a second metric based on an analysis of the extracted digital watermark, the first metric being compared to the second metric to measure degradation of the extracted digital watermark.

13. The method of claim 11 wherein the evaluating step includes comparing signal peaks of the digital watermark to signal peak information conveyed by the message.

14. The method of claim 13, wherein the signal peaks comprise frequency domain peaks.

15. A fragile digital watermarking method comprising:  
embedding a digital watermark in a media signal;  
rendering the embedded media signal;  
detecting the digital watermark from the rendered embedded media signal;  
generating a metric based on the detected digital watermark; and  
embedding the metric in the embedded media signal as part of the digital watermark.

16. The method of claim 15 wherein said step of rendering comprises at least one of printing, broadcasting and streaming.